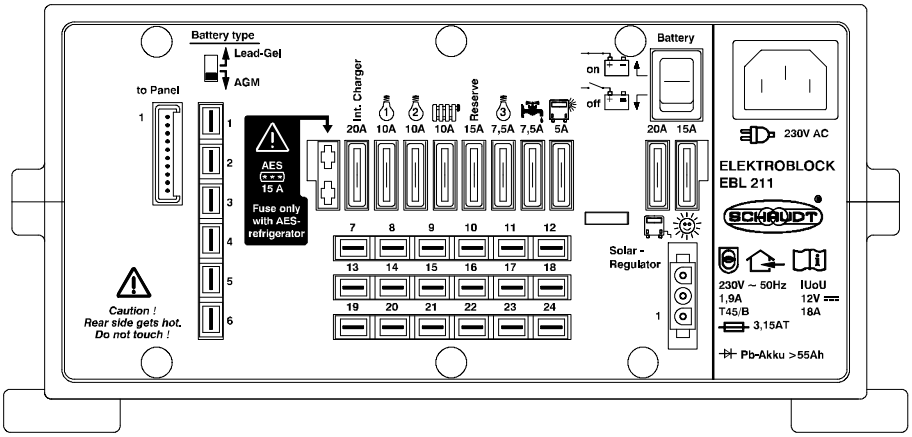
Operating Instructions



Electroblock EBL 211

Table of contents

1 Safety information

1.1 Meaning of safety symbols

▲ DANGER!
Failure to comply with this sign may result in danger to life or physical condition.

▲ WARNING!
Failure to comply with this sign may result in injury.

▲ ATTENTION!
Failure to comply with the sign may result in damage to equipment or other connected loads.

1.2 General safety instructions

The design of the device is state-of-the-art and complies with approved safety regulations. Failure to observe the safety instructions may nonetheless lead to injury or damage to the device.

Only use the device when it is in perfect technical condition.

Any faults affecting the safety of individuals or the proper functioning of the device must be repaired immediately by specialists.

▲ DANGER!
Parts carry 230V mains voltage.
Risk of fatal injury due to electric shock or fire:

- Do not carry out maintenance or repair work on the device
- If cables or the device housing are damaged, no longer use the device and isolate it from the power supply
- Ensure that no liquids enter the device
- The mains connection line may only be replaced by an authorised customer service department or by those qualified.

▲ WARNING!
Hot components
Burns:

- Only change blown fuses when the device is fully de-energised
- Blown fuses may only be replaced once the cause of the fault is known and has been rectified
- Never bypass or repair fuses
- Only use original fuses rated as specified on the device
- Device parts can become hot during operation. Do not touch them.
- Never store heat sensitive objects close to the device (e.g. temperature sensitive clothes if the device has been installed in a wardrobe)

1.3 Liability limitation

All technical information, data and instructions pertaining to installation, operation and maintenance contained within this operating manual and associated installation guide were up-to-date when the documents were printed, and were compiled in good faith in due consideration of experience and findings gained previously.

No legal claims can be derived from the specifications, illustrations and descriptions in this operating manual or associated installation guide.

The manufacturer assumes no lability for damage due to:

- a failure to comply with this operating manual and associated installation guide
- improper assembly and/or installation
- non-intended use
- improper repairs
- technical modifications
- use of unapproved spare parts

2 Introduction

This instruction manual contains important information for the safe operation of equipment supplied by Schaudt. Make sure you read and follow the safety instructions provided.

The operating instructions should always be kept in the vehicle. All safety information must be passed on to other users.

▲ This device is not intended to be used by those (including children) with limited physical, sensory or mental aptitude or lack of experience and/or knowledge unless they are supervised by a person responsible for their safety or have received instruction from this person as to how the device is used.

Children must be supervised to ensure they do not play with the device.

This device is intended for installation into a vehicle.

3 Operation

The electroblock is operated solely from the operator and control panel connected (apart from battery isolation).

Operation of the electroblock is not required for daily use.

Settings only have to be configured when the battery type is changed (AGM or lead-gel), during initial start-up or when retrofitting accessories (refer to Section 3.2 and the installation instructions EBL 211).

3.1 Switching system on/off

▲ ATTENTION!

Incorrect electroblock settings.

Damage to connected devices. Therefore prior to starting:

- Ensure the leisure area battery is connected.
- Ensure that the battery selector switch (Fig. 4, Pos. 5) is set to the correct position for the battery inserted.
- Ensure that the AES fuse (Fig. 4, Pos. 3) is only inserted when an AES refrigerator is connected. The leisure area battery may totally discharge otherwise. Damage to the battery is possible.

Battery cut-out

Deactivate the battery cut-out (shutdown) as required (refer to Section 3.4)

12 V main switch (on operator and control panel)

Use the main 12 V switch (see instruction manual of relevant control and switch panel) to switch on/off all the consumers and the control and switch panel.

Exceptions:

- Step
- Frost protection valve
- AES refrigerator

Please refer to the operating instructions for the operator and control panel for further information.

Operation with solar regulator

▲ ATTENTION!

If there is no backup function for the battery, damage to devices connected may result. So therefore:

- Do not operate solar regulator without battery connected.

Use on a 230 V generator or car ferries

If a current generator is used for the 230V motorhome supply, the generator must not exceed the mains connection ratings (see ”Technical details”, Section 5.2).

▲ ATTENTION!

- To avoid voltage peaks during warm-up, do not connect the generator until it is running in a stable manner. Otherwise the electroblock, the 12 V consumers or other devices connected could suffer damage. It is essential the generator conforms to mains supply specifications.

3.2 Changing the battery

▲ ATTENTION!

Use of incorrect battery types or incorrectly rated batteries.

Damage to the battery or devices connected to the electroblock:

- Batteries may only be changed by qualified personnel.
- Follow the battery manufacturer's instructions.
- Only use the electroblock to connect to 12V power supplies with re-chargeable 6-cell lead-gel or AGM batteries. Do not use any unsuitable battery types.

Changing the battery

▲ Normally only batteries of the same type and capacity should be used, i.e. the same as those installed by the manufacturer.

▶ Electrically isolate the battery from the electroblock. For this, activate the battery cut-out (refer also to Section 3.4).

▶ Remove "+ solar cell" connector on the solar charge regulator (if available).

▶ Isolate the electroblock from the mains voltage (230V AC).

▶ Replace the battery.

▶ After changing the battery, recheck which type of battery has been inserted.

▲ DANGER!

Incorrect setting of the battery selector switch.

Risk of explosion due to build up of explosive gases:

- Move the battery selector switch to the correct position

▲ ATTENTION!

Incorrect setting of the battery selector switch.

Damage to the battery.

- Move the battery selector switch to the correct position

▶ Disconnect the electroblock from the mains before adjusting the battery selector switch.

▲

However, suitability must be checked on a case-by-case basis using the specifications from the battery manufacturer and the charging parameters of the electroblock.
The charging parameters are specified in Section 5.2.

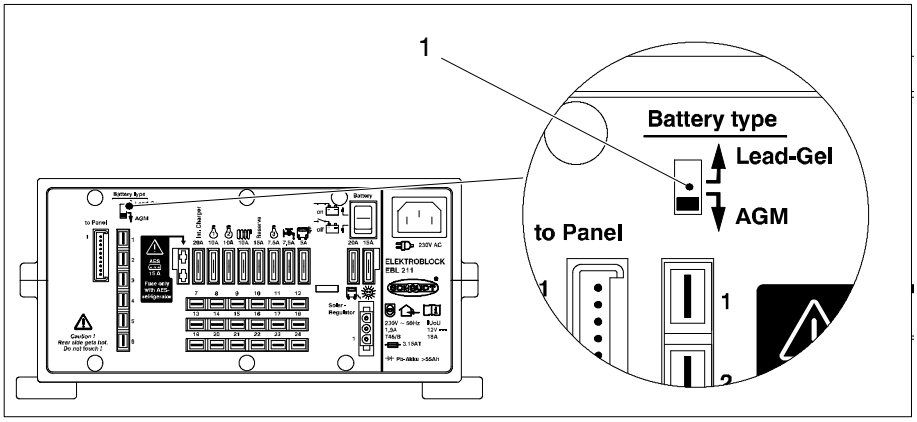


Fig. 1 Battery selector switch

▶ Move the battery selector switch (Fig. 1, Pos. 1) to the correct position using a thin object (such as a ballpoint pen):

- Lead-gel battery: Move the battery selector switch to ”Lead-gel”.
- AGM battery: Move the battery selector switch to ”AGM”.

Starting up the system

▶ Plug the ”+ solar cell” connector into the solar charge regulator (if available).

▶ Start up the system as described in section 3.1.

3.3 Faults

Flat vehicle fuses

A fault in the power supply system is usually caused by a blown fuse.

For faults with the control and switch panel, the entire system must be switched off from the battery cut-off and turned on again after about 1 minute.

Please contact our customer service address if you cannot rectify the fault using the following table.

If this is not possible, such as when you are abroad, a specialist workshop will be able to repair the device. In this case, you must ensure that the warranty is not invalidated by incorrect repairs being carried out. Schaudt GmbH will not accept any liability for damage resulting from such repairs.

Fault	Possible cause	Remedy
Leisure area battery is not charged during 230 V operation (battery voltage constantly below 13.3 V)	No mains voltage	Switch on the automatic fuse in the vehicle
		Have the mains voltage checked
	Defective electroblock	Contact customer service
Leisure area battery is overcharged during 230 V operation (battery voltage constantly above 14.5 V)	Defective electroblock	Contact customer service
Starter battery is not charged during 230 V operation (battery voltage constantly below 13.0 V)	No mains voltage	Switch on the automatic fuse in the vehicle
		Have the mains voltage checked
	Defective electroblock	Contact customer service
Leisure area battery is not charged during mobile operation (battery voltage below 13.0 V)	Defective alternator	Have the alternator chekked
	No voltage on D+ input	Check fuses and wiring
	Defective electroblock	Contact customer service
The leisure area battery is overcharged during mobile operation (battery voltage permanently above 14.3 V)	Defective alternator	Have the alternator chekked
The refrigerator does not work during mobile operation	No power supply to the refrigerator	Have the fuse and cabling checked
	Defective electroblock	Contact customer service
	Defective refrigerator	Havetherefrigeratorchekked

Fault	Possible cause	Remedy
Solar charger does not work (power supply and engine are off)	Solar panel in (partial) shade or covered (snow or dirt)	Move solar panel out of shade or clean it.
	Solar charge regulator not plugged in	Plug in solar charge regulator
	Defective fuse or cabling	Have the fuse and cabling checked
	Solar charge regulator defective	Have solar charge regulator checked
No 12 V supply in the leisure area	12 V main switch for leisure area battery switched off	Switch on the 12 V main switch for the leisure area battery.
	Battery cut-out activated	Deactivate the battery cut-out
	Defective fuse or cabling	Have the fuse and cabling checked
	Defective electroblock	Contact customer service
Operation of the electroblock not possible from the control panel.	Defective electroblock	Contact customer service

▲ The charging current is reduced automatically if the device becomes too hot due to excessive ambient temperature or lack of ventilation. Always prevent the device from overheating nevertheless.

▲ If the automatic shutdown mechanism of the battery monitor is triggered, fully charge the leisure area battery.

3.4 Closing down

3.4.1 Closing down the system

▲ **ATTENTION!**

Total discharge results in damage to the leisure area battery. So therefore:

- Fully charge the leisure area battery before and after a shutdown (connect the vehicle to the mains for at least 12 hours and 24 hours for an 80Ah and 160Ah battery respectively)

▲ **ATTENTION!**

Exceeding permitted input voltages can cause damage to consumers connected. So therefore:

- Do not operate the solar charge regulator without a battery.
- When the battery is changed or removed, first unplug the ”+ solar cell” connector on the solar charge regulator.

Isolate the leisure area battery from the on-board 12 V supply

Disconnect the leisure area battery from the 12V power supply when the motorhome is not used for a longer period (during the winter for example). For this, the system has a battery cut-out mechanism which isolates electrically the leisure area battery from the vehicle.

▶ Fully charge the leisure area battery before closing down the system.

▶ Switch off the 12V main switch on the control panel.

▶ Move battery cut-out switch (switch, see Fig. 4, Pos. 5) to position ”Battery OFF”.

The battery cut-out switch isolates the following connections from the leisure area battery:

- 12V consumers
- Frost protection valve
- Operator and control panel

▶ Remove the step fuse (refer to Fig. 4, Pos. 6) on the electroblock

▶ For vehicles with AES refrigerator:
Remove the AES fuse (refer to Fig. 4, Pos. 3) on the electroblock

▲ The battery alarm is no longer active.

The frost protection valve opens for certain heater systems when the leisure area battery is isolated from the electroblock via the battery cut-out. The boiler and water tank empty when the frost protection valve is open. See the instruction manual for the heater system for further information.

The leisure area battery **is also** charged by the internal charger module, an additional battery-charger, the solar charger regulator and the alternator **when** the **battery cut-out is activated**.

3.4.2 Cancelling the shutdown

▶ Move battery cut-out switch (switch, see Fig. 4, Pos. 5) to position ”Battery ON”.

▶ Insert the step fuse (refer to Fig. 4, Pos. 6) on the electroblock

▶ For vehicles with AES refrigerator:
Insert the 15A AES fuse (refer to Fig. 4, Pos. 3) on the electroblock

▶ After having disconnected the leisure area battery from the electroblock using the battery cut-off switch or after changing the battery, briefly switch on the 12 V main switch on the control and switch panel to start up the consumers.

4 Application and functions in detail

4.1 General

▲ This device is intended solely for installation in a vehicle.

The electroblock is the central energy supply device for all 12 V consumers in the electrical system on board the motorhome/caravan. It is normally located inside a cupboard or storage area and is accessible from the front for fuse changes.

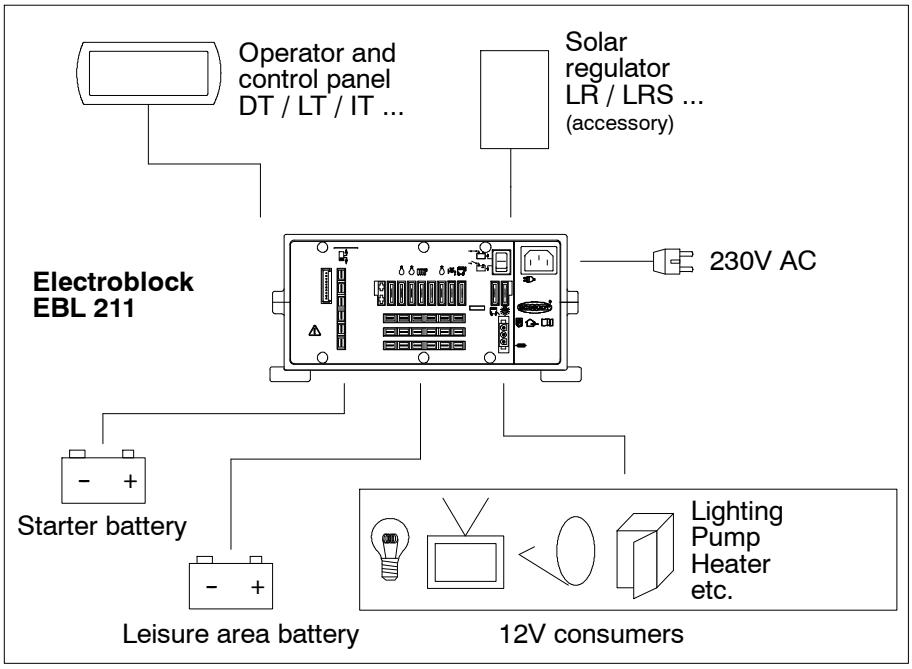


Fig. 2 On-board power supply system

Modules

The EBL 211 electroblock comprises:

- a charge module for charging all batteries connected
- the complete 12V distribution unit
- the fuses for the 12V circuits
- a main switch module
- battery monitor
- other control and monitoring functions

System devices

A control and switch panel must be connected for operation. This device controls the electrical functions in the motorhome's leisure area as well as the accessories.

There is a connection for a solar charge regulator.

Flat vehicle fuses protect the various circuits. Exceptions here are the step and the frost protection valve.

Protective circuits

- Excess temperature
- Overload
- Short circuit

4.2 Battery functions

Suitable batteries

6-cell AGM or lead-gel batteries, 55 Ah and above

Battery cut-out

The battery cut-out (at the battery cut-out switch of the electroblock, see Fig. 4, Pos. 15, see also Section 3.4) isolates the following connections from the leisure area battery:

- all 12 V consumers
- the frost protection valve

This prevents slow discharge of the leisure area battery by the standby current during shutdown of the vehicle (discharge with approx. 4 Ah in month).

The batteries can still be charged using the electroblock, the alternator, an auxiliary charging unit or the solar charge regulator, even when the battery cut-out switch is switched off.

Battery selector switch

The switching option provided by the battery selector switch ensures optimum charging of the two battery types, lead-gel and AGM.

Battery monitor with automatic disconnect

The battery monitor compares the voltage of the leisure area battery with a reference voltage. As soon as the battery voltage falls below 10.5 V, all 12 V consumers are switched off. Only the step, the frost protection valve and the AES refrigerator are still powered. The automatic disconnector is not triggered by short-term low voltage (shorter than 2 seconds), caused by high current when switching on consumers.

If an overload or an insufficiently charged leisure area battery causes the voltage to fall so low that the automatic disconnector is triggered, any non-essential consumers should be switched off.

It may be the case that only the 12 V supply is started
for a short time. For this, switch on the 12V main switch on the control and switch panel.

However, if the battery voltage remains below 11.0 V, you cannot switch the 12 V power supply back on.

Fully charge the leisure area battery as soon as possible. For more information, see the description of ”battery voltages”.

4.3 Additional functions

Automatic switch function for AES/compressor refrigerator

This relay supplies the AES/compressor refrigerator with power from the starter battery when the vehicle engine is running and the D+ connection is live. An AES/compressor refrigerator is powered by the leisure area battery when the vehicle engine is not running.

Step fuse

The ”Step” output is fused with a 15 A fuse and is supplied continually, even when the main 12 V switch is OFF.

Battery charging with solar charging regulator

Maximum permitted charge current 14 A, protected with 15 A
Depending on the solar charge regulator used, either only the leisure area battery is charged or the leisure area battery and the starter battery.

Automatic switch function for awning light

The awning light only works when the power supply is on, the vehicle engine is off and the D+ connection is not live.

Mains charging starter battery

This feature provides an automatic float charge for the starter battery at up to 2 A when the 230 V mains is connected to the electroblock.

5 Technical details

5.1 Mechanical details

Dimensions 130 x 275 x 170 (H x W x D in mm), including attachment feet

Weight 2.0 kg

Casing PA (polyamide), gentian blue (RAL 5010)

Front Aluminium, powder coated, light grey (RAL 7035)

5.2 Electrical details

Mains connection 230 V AC voltage ±10 %, 47–63Hz sinewave, protection class I

Current consumption 1.9 A

Suitable batteries 6-cell lead-gel or AGM batteries, 80 Ah and above

Standby current from leisure battery

Dependent on the control panel: approx. 1 mA, plus consumption of refrigerator control electronics

Conditions for the measurement:

- approx. 10 minutes after disconnection from the mains
- 12.6 V battery voltage
- Battery alarm OFF
- Battery cut-out switch ON
- Lighting for operator and control panel OFF
- All consumers switched off
- 12 V main switch OFF

D+ loading

Loading of D+ output of the alternator by the electroblock approx. 0.5 mA without current consumption on D+ point

Current-carrying capacity

12 V outputs	A maximum of 90% of the nominal current of the relevant fuse may be drawn.
Frost protection valve output	max. 0.1 A
D+ point	1 A for fusing D+ input with 2 A

Battery charging via mains connector

Leisure area battery

Battery selector switch setting	lead-gel	AGM
Charging curve	IUoU	IUoU
Final charge voltage	14,4 V / 16 h	14,7 V / 4 h
Charge current	18 A	18 A
Voltage for trickle charge	13,7 V with automatic switchover	13,7 V with automatic switchover

Battery charging of the starter battery

Starter battery

Charge current trickle charge	max. 2 A
Charging voltage	typ. U_{Wbat} – 0,2 V

IUoU curve

New charge cycle, switchover to main charging	for battery voltage < 13.7 V with approx. 5 seconds delay

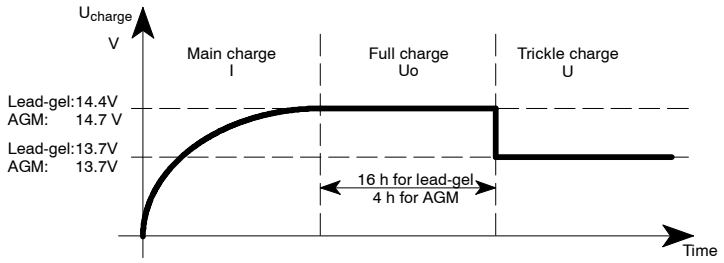


Fig. 3 Charging voltage with EBL 211 electroblock

I Main charge with maximum 18 A charging current, electronically limited, up to final charging voltage. Start of charge also for completely discharged batteries.

Uo Automatic switchover to full charge with constant 14.4 V (lead-gel) or 14.7 V (AGM). The duration of the full charge phase is based on the battery type and is set on the device.

U Automatic changeover to compensation charge with constant 13.7 V. In the compensation charge phase, the voltage at the output of the charging module is constant.

Start of a new charging cycle by switching over to main charge, if the battery voltage falls below 13.7 V for more than 5 seconds when loaded. Start of charge also for completely discharged batteries. The internal charge module can also be operated without leisure battery.

6 Maintenance

The electroblock requires no maintenance.

Cleaning

Clean the electroblock with a soft, slightly damp cloth and mild detergent. Never use spirit, thinners or similar substances. Do not allow liquids to enter the electroblock.

Appendix

A Special fittings/accessories

Controlpanel Schaudt DT ..., LT ... or IT ... control panel (required for operation)

Solar charge regulator Schaudt solar charge regulator, type LR ... , LRS ... or LRM ... for solar modules with a total charge current of 14 A with 3-pin connector (charging of leisure area and starter batteries possible)

B Customer service

Customer service

Schaudt GmbH, Elektrotechnik & Apparatebau
Planckstraße 8
88677 Markdorf
Germany

Phone: +49 7544 9577-16

Web: www.schaudt-gmbh.de

Email: kundendienst@schaudt-gmbh.de

Send in device Returning a faulty device:

- ▶ Complete and enclose the fault report, see Appendix C.
- ▶ Send it to the addressee (free delivery).

C Fault report

In the event of damage, please fill in the fault report and send it with the faulty device to the manufacturer.

Device type: _____
Item no.: _____
Vehicle: Manufacturer: _____
Model: _____
Own installation? Yes ❑ No ❑
Upgrade? Yes ❑ No ❑

Following fault has occurred (please tick):

- ❑ Electrical consumers do not work – which? (please specify below)
- ❑ Switching on and off not possible
- ❑ Persistent fault
- ❑ Intermittent fault/loose contact

Other comments:

D Layout

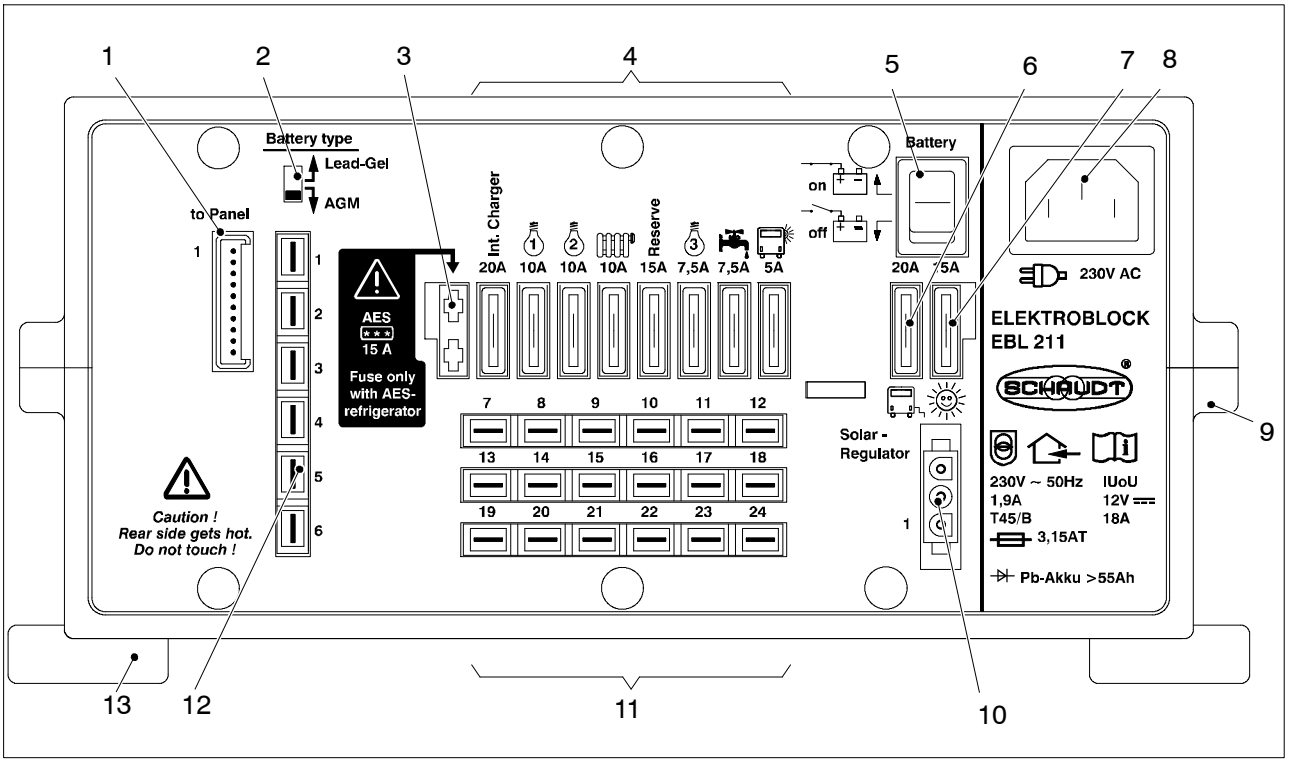


Fig. 4 Layout of the EBL 211 electroblock (front)

1 Connector for control panel
2 Battery switchover (types gel / AGM)
3 Flat vehicle fuse for AES refrigerator
4 Flat vehicle fuses for consumers
5 Battery cut-out
6 Step fuse
7 Flat vehicle fuse for solar regulator
8 Mains connection
9 Housing
10 Connection block, solar regulator (supply)
11 6.3 mm consumer connectors
12 Connector block for batteries
13 Device feet

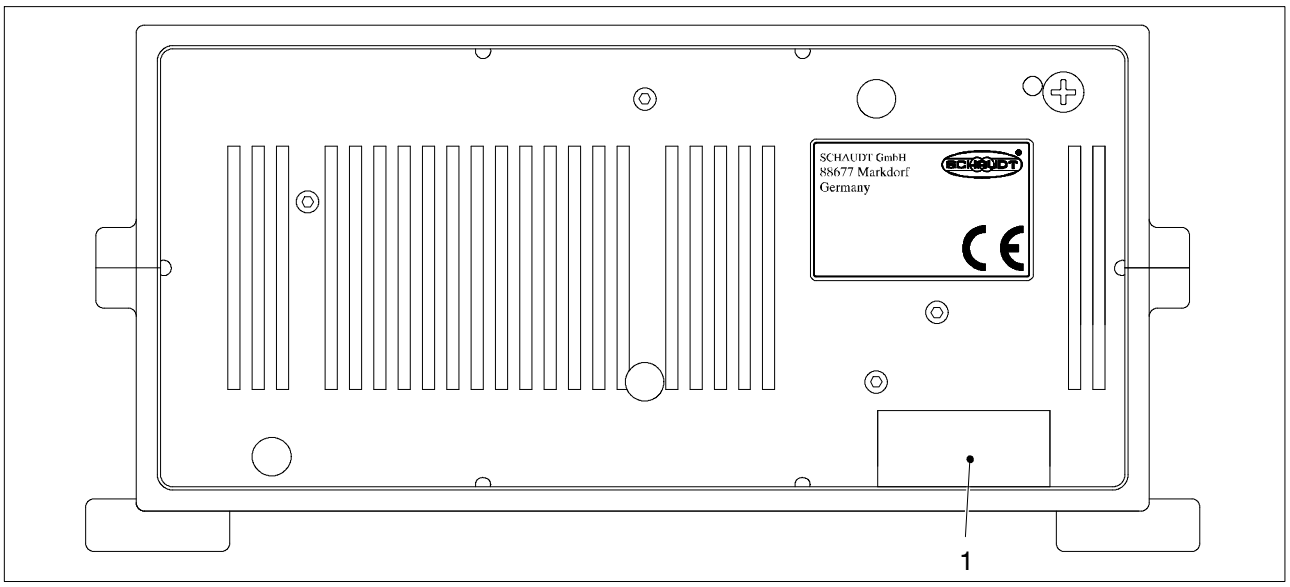
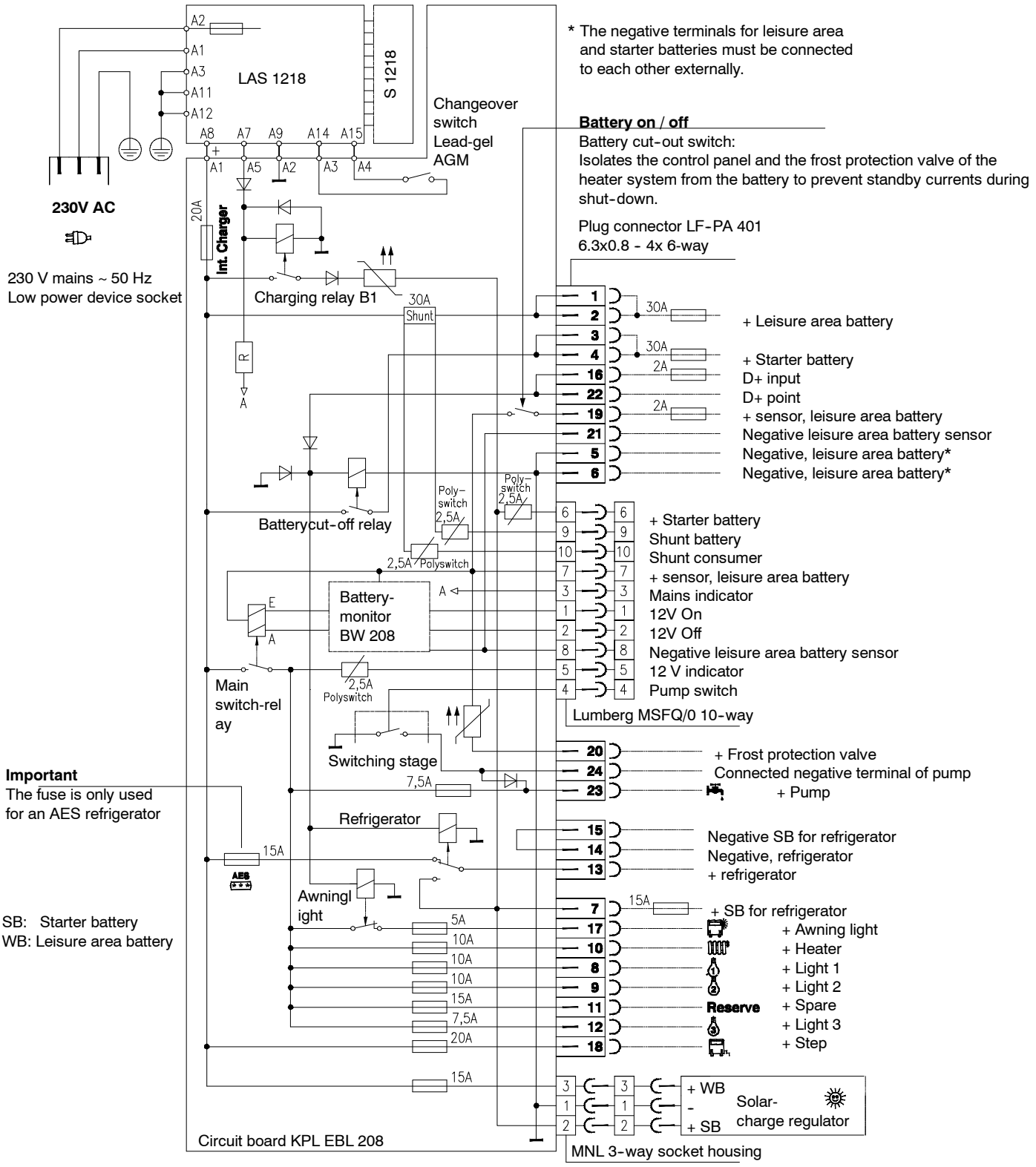


Fig. 5 Layout of EBL 211 electroblock (rear)

1 Cover

E Block diagram/wiring diagram



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